ABSTRACT

A method for modeling visual images and wave propagation describes a scene mathematically, calculates certain parameters and visibility areas from input data, and traces the passage of wavefronts through the scene. The scene represents a particular configuration of objects having distinct boundaries, such as interfacing strata. Wavefronts are considered to emanate from a particular source, for multiple sources. Each wavefront is subdivided into discrete front elements that impinge on boundary elements, as determined from computed visibility areas. Each front element that impinges on a boundary element is analyzed to determine reflected front elements and refracted front elements. Those front elements are traced to see if they impinge on another boundary element or a receiver. A front element is traced until its energy falls below a threshold or it leaves the scene. Ray paths from each source to each receiver are computed from which wave-related output parameters are computed and displayed.